FORMULATION AND EVALUATION OF HERBAL BASE HAIRREMOVALCREAM

A. Vasanthan[1*], N. Nisha Shakshi[2], M. Pavithra[3], R. Piruthika[4]

[1], Associate Professor, Sri Vijay Vidyalaya College of Pharmacy, Dharmapuri, Tamil Nadu (India)
[2, 3, 4] B. Pharm, Students, Sri Vijay Vidyalaya College of Pharmacy, Dharmapuri, Tamil Nadu (India)

ABSTRACT- *The present investigation focused on the formulation and evaluation of an herbal hair removal cream prepared using natural and cosmetic-grade ingredients to achieve efficient depilation with minimal skin irritation. Sodium hydroxide served as the depilatory agent responsible for hair removal. Beeswax and cetostearyl alcohol were incorporated to impart suitable consistency, stability, and emollient characteristics to the formulation. Glycerine was included as a moisturizing agent to retain skin hydration, while methyl paraben was used as a preservative to enhance shelf life. Herbal components such as turmeric, neem, tulsi, and ginger were added due to their antimicrobial, anti-inflammatory, and skin-protective properties. Jasmine oil was incorporated to provide a pleasant fragrance and improve consumer acceptability. The prepared cream was evaluated for parameters including physical appearance, pH, homogeneity, spread ability, stability, and hair removal efficiency. The results demonstrated satisfactory depilatory activity, good stability, and favourable skin compatibility, indicating that the developed formulation is a safe, effective, and skin-friendly herbal hair removal product.*

Key words: Herbal hair removal cream, depilatory formulation, sodium hydroxide, beeswax, cetostearyl alcohol, turmeric, neem, tulsi, ginger, glycerine, jasmine oil, methyl paraben.(1)

INTRODUCTION

Hair is a fine, flexible filament that develops from follicles located within the skin and represents one of the fastest growing tissues in the human body. It is primarily composed of keratin, a fibrous structural protein that constitutes approximately 88% of hair and is rich in the amino acid cysteine and sulphur. Keratin contributes to the strength, resilience, and protective function of hair and exhibits resistance to water and various chemical agents. The mechanical strength of hair is mainly attributed to disulfide bonds formed between cysteine residues, where sulphur atoms create strong linkages that enhance hair stability. Hair growth follows a repetitive biological cycle consisting of three distinct phases-anagen, catagen, and telogen-during which hair undergoes active growth, regression, and eventual shedding.[2]

Hair growth phases:

Hair growth occurs in a repetitive cycle within the hair follicles and progresses through four major stages: anagen (growth phase), catagen (transitional phase), telogen (resting phase), and exogen (shedding phase).

The anagen phase represents the active growth stage and is the longest phase of the hair cycle, lasting approximately 2 to 7 years. During this period, hair grows continuously as the follicles receive an adequate supply of nutrients through the bloodstream.

Following the anagen phase is the catagen phase, a brief transitional stage that typically lasts for about 2 to 3 weeks. In this phase, hair growth ceases, and the hair follicle gradually detaches from its nourishing blood supply.

The telogen phase, also known as the resting phase, lasts for around 3 months. During this stage, hair growth remains inactive, and the hair shaft becomes weaker as it prepares for shedding.

The final stage, known as the exogen phase, is considered a part of the telogen phase and lasts approximately 2 to 5 months. During this period, old hair is shed from the scalp while new hair begins to develop within the follicles to replace the lost strands.[3]

Function of hair:

Hair performs several important functions in the human body. Some of the functions are protection, sensory, regulation, expression.

- ❖ It protects the scalp from harmful sunlight and helps reduce the effects of ultraviolet rays, while eyebrows and eyelashes guard the from the dust, sweet and other foreign particles.

- ❖ Hair also plays a role in sensation because the hair follicles are sensitive to touch and movement, allowing us to feel slight changes in our surroundings.

- ❖ It also helps to regulation the body temperature by trapping warmth and causing goosebumps when the body feels cold.

- ❖ In additional, hair is also important for personal appearance, as it contributes to self-identity, cultural expression and fashion[4]

HAIR REMOVAL CREAM

Hair removal creams, commonly referred to as depilatory creams, are cosmetic formulations designed to eliminate unwanted hair from the surface of the skin. These products are generally prepared as emulsions and function by chemically dissolving hair at or slightly below the skin surface, a process known as the depilatory method.

Sodium hydroxide is the primary chemical agent responsible for hair removal in these formulations. Upon application, it reacts with the keratin protein that constitutes hair, disrupting its structure by breaking down the protein bonds. As a result of keratin degradation, the hair shaft becomes soft and gelatinous in nature, allowing it to be easily removed from the skin using a spatula or cloth, thereby leaving the skin smooth and hair-free.[5]

Hair removal creams can be applied to most areas of the body, although their use is generally avoided on highly sensitive regions such as the face. The popularity of depilatory products has increased significantly within the cosmetics and personal care industry, driven by growing awareness of personal grooming among both men and women.

Individuals remove unwanted hair for various reasons, including aesthetic preferences, cultural traditions, hygienic concerns, and medical requirements. Depilatory creams provide a convenient, non-invasive, and painless method for achieving smooth and hair-free skin.

Ideal characteristics of hair removal cream:

- ❖ The hair removal cream should not leave stains on the skin or clothes.
- ❖ It should not have little or no smell.
- ❖ It must be safe, non-toxic, gentle on the skin and easy to wash off with water.
- ❖ The cream should work quickly and remove hair effectively while spreading smoothly over the skin.
- ❖ It should be suitable for the normal pH of the skin and contain preservatives to increase its self-life.
- ❖ The cream should be thicker than a lotion, and should not cause any harmful effects when applied.[6]

Advantages:

- The hair removal cream provides a painless way to remove unwanted hair.
- They are easily available in cosmetic and personal care stores and are simple to use.
- These creams do not cut or injure the skin, making them safer than the razors.
- They also remove hair slightly below the skin surface, which helps slow down hair regrowth.
- Another benefit of the hair removal cream treatment can be done conveniently at the home.

Disadvantage:

- The chemical present in the hair removal cream maya causes the skin irritation, redness, and discomfort in some people.
- There is also a chance of developing in grows hairs.
- These creams should not be used in the very sensitive area of the skin and many depilatory products have a strong chemical smell that some users may find unpleasant.[7]

Side effects:

- Hair removal creams may sometimes cause the redness, itching, or skin irritation.
- In rare cases, allergic reaction can occur.
- Improper use or leaving the cream on the skin for too long may lead to chemical burns.
- Repeated application, especially on the sensitive skin can also result in darkening of the skin.

Benefits:

- Hair removal cream remove hair without causing the pain usually felt during waxing or threating.
- They leave the skin smooth and free from stubble because the hair is dissolved slightly below the skin surface.
- As a result, hair takes longer to grow.
- Unlike razor, these creams reduce the risk of cuts and razor burns.
- Some depilatory creams are especially made for sensitive skin and can be used on depilatory areas.
- Many creams also contain moisturizing ingredients that helps to keep skin soft and hydrated.

TABLE NO 01: MATERIALS

INGREDIENT	FUNCTIONS
Sodium Hydroxide	Depilatory agent
Bees Wax	Emulsifying agent, stabilizer and give thickness to the cream, emollient.
Glycerine	Humectant, moisturizer.
Methyl paraben	Preservative.
Dry ginger powder	Anti-inflammatory, antiseptic
Turmeric	Anti-inflammatory, anti-oxidant.
Neem	Antiseptic, Antibacterial, reduces the dark sports, blemishes and redness.
Tulsi	Antibacterial, and add glow on skin.
Cetostearyl alcohol	Emulsifier, thickener
Jasmine oil	Fragrance

METHOD OF PREPARATION:

PREPARATION OF EXTRACT:

Fresh leaves of neem, tulsi, turmeric, and ginger are first collected and washed thoroughly with clean water to remove dirt and unwanted particles. The clean leaves are then shade dried to remove extra moisture. After drying, the plant materials are crushed or ground into a course paste or powder. About 10g of each powdered plant material is taken and mixed separately with 100 ml of distilled water. The mixtures are then heated at around 100-degree Celsius. After heating the solutions are allowed to cool and are filtered to obtain clear extracts, which are collected and stored for further use.[8]

PROCEDURE:

- Accurately weigh and measure the required quantities of sodium hydroxide, cetostearyl alcohol, beeswax, glycerine, neem powder, tulsi powder, turmeric powder, ginger powder, and purified water.
- Dissolve sodium hydroxide in water in a separate beaker, stirring gently, and place the solution in a water bath to prevent splashing.
- In another container, combine cetostearyl alcohol and beeswax and heat the mixture in a water bath until both componentsarecompletelymelted.Maintain the temperature of the melted mixture between 50–60 °C.
- Add glycerine, methyl paraben, and herbal ingredients including ginger, turmeric, tulsi, and neem extracts to the molten wax phase.
- Stirthemixturethoroughlyuntilasmooth, homogeneousblendisobtained. Gradually add the warm sodium hydroxide solution to the mixture with continuous stirring, followed by the addition of jasmine oil for fragrance.
- Continue stirring until the formulation cools and thickens to the desired consistency.
- Discontinue stirring once a uniform cream consistency is achieved. Adjust the pH and viscosity of the formulation if necessary.
- Finally, mix well and transfer the prepared hair removal cream into a suitable container for storage.

Table no 02:

INGREIENT	F1	F2	F3	F4	F5
Sodium hydroxide	1g	1.5g	2g	2.5g	1.5g
Bees wax	2.5g	2g	1.5g	1g	2.5g
Methyl paraben	2.5g	2g	1.5g	1g	2.5g
Ginger powder	0.1g	0.1g	0.1g	0.1g	0.1g
Turmeric powder	0.1g	0.1g	0.1g	0.1g	0.1g
Neem powder	1g	1g	1g	1g	1g
Tulsi powder	1g	1g	1g	1g	1g
Cetostearyl alcohol	1g	1g	1g	1g	1g
Jasmine oil	2drops	2drops	2drops	2drops	2drops
Water	q.s.to10g	q.s.to10g	q.s.to10g	q.s.to10g	q.s.to10g

EVALUATION

Organoleptic properties:

Texture: Smooth and free from lumps
Colour: Creamy yellow
Odour: Slightly pungent

pH test:

The pH of the cream was determined using a calibrated digital pH meter. About 1g of cream was dispersed in 10 ml of distilled water and the pH was measured at room temperature. The pH was found to be in acceptable range (8-10), which is suitable for depilatory action and does not cause excessive irritation to the skin.

Homogeneity:

Homogeneity of the cream was evaluated by visual inspection. A small quantity of the cream was pressed between the fingers to check for the presence of lumps or gritty particles. The formulation showed a smooth, uniform appearance without any phase separation, indicating good homogeneity.

Viscosity:

Viscosity was measured using a Brookfield viscometer at a specified spindle speed. The cream exhibited optimum viscosity, ensuring easy application, good spread ability and adequate retention on the skin during the hair removal process.[10]

Pharmacological evaluation (Hair removal activity):

The depilatory activity was evaluated by applying the cream on a small area of skin with hair and leaving it for a specified time (5-10 minutes). The cream effectively removed hair without causing redness, itching, or burning sensation, indicating good pharmacological activity and skin compatibility.

Wash ability:

Wash ability was assessed by applying the cream on the skin and then washing with tap water. The cream was easily washable without leaving greasy or sticky residues, which improves patient acceptability.

Spread ability:

Spread ability was determined by placing a fixed quantity of cream between two glass slides and application and uniform coverage over the skin.[11]

Table no 03: RESULT

PARAMETER	F1	F2	F3(optimal)	F4	F5
Ph	10.5	11.2	11.8	12.3	12.9
Viscosity(cps)	18,000	19,500	21,500	24,000	28,000
Spreadability	22.5	24.1	28.4	26.2	23.0
Washability	Good	Good	Excellent	Good	Moderate
Homogeneity	Yes	Yes	Yes	Yes	Slightly gritty

The safe and efficacy of hair removal cream was evaluated as per pharmaceutical evaluation test for cream.

CONCLUSION:

The formulated herbal hair removal cream demonstrated satisfactory physicochemical properties, effective depilatory activity, and good skin compatibility. The evaluation results indicated acceptable stability, ease of application, and user compliance, suggesting that the formulation is a safe, efficient, and skin-friendly option for the removal of unwanted hair.

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